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ABSTRACT

Handheld computers have gone beyond the world of business and are now finding their way into the hands of social studies teachers and students. This paper discusses how social studies teachers can use handheld computers to aid anytime/ anywhere course management. The integration of handheld technology into the classroom provides social studies teachers an opportunity to promote student-centered learning. Integration strategies that promote technology integration and student-centered learning are described. Ideas range from the use of handhelds as creative and reflective writing journals to the use of handhelds as databases that store data to promote analysis. The range of software promoting the integration of handhelds into the K-12 setting expands daily. (Contains 11 references.) (Author/BT)

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Handheld Computers in the Classroom: Integration Strategies for Social Studies Educators

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Abstract

Handhelds computer have gone beyond the world of business and are now finding their way into the hands of social studies teachers and students. This article begins by discussing how social studies teachers can use handhelds to facilitate anytime, anywhere course management. The integration of handheld technology into the classroom provides social studies teachers an opportunity to promote student centered learning. Integration strategies that promote technology integration and student-centered learning are offered. Ideas range from the use of handhelds as creative and reflective writing journals to the use of handhelds as databases that store data and promote analysis.

Introduction

Handheld computers, also known as Personal Digital Assistants (PDAs), serve as an organizer of personal and professional information. Handhelds are now being broadly accepted in a variety of educational settings. Handhelds come with software that allows social studies educators and students to perform a range of tasks, including synchronizing data with desktop or laptop computers, accessing e-mail, managing appointments and course assignments. Handheld software can also promote cooperative learning and data analysis activities in the social studies classroom. Their inexpensive costs and portability make them an attractive alternative to more expensive notebook computers.

Literature Review

Handhelds have been used to augment and supplant computers in classrooms because they are readily available, inexpensive, and easy for educators to use. Handhelds are effective classroom organizational tools for educators in K-12 classrooms (Ray, et. al., 2001). Pownell and Bailey (2000) agree, observing that handhelds effectively support how teachers work and use information in their classrooms. Soloway (2000) contends that handhelds "support cycles of doing and reflecting"(p. 1) by encouraging teachers and students to revisit their written work more often. handhelds give teachers greater flexibility in managing classroom assignments and in creating student-specific instructional plans (Ray et. al., 2001; Soloway, 2000). They are also a fast and efficient method for accurately transferring data into a computer (Hecht, 1997; Stover, 2001). Because handhelds allow teachers and students to readily share files and other information by "beaming" files from one handheld to another, collaboration and sharing of

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information and software is enhanced. This sharing and commenting on other's work leads to an increase in the quality of finished products, such as written drafts and reflective discourses (Soloway, 2000).

Instructional Productivity

Many teachers and school systems have begun to embrace the technology. Acceptance is supported by the low cost and ease of use of these devices. Whenever parents request appointments, the teacher can input the date and time in the handheld's calendar. This not only records the appointment time, but it also allows the instructor to jot a quick note as a reminder about the topic of discussion for the meeting. Follow up notes about the meeting can be added to the original note during or after the meeting. This feature is particularly useful when documentation or follow up meetings are required. These notes can later be synched to a stationary computer and copied/pasted into word processing or other software where the information is needed. (Synching involves taking the file from the classroom computer to the handheld). They can also be beamed or e-mailed to administrators.

Daily assignments, such as required readings, grading rubrics, and worksheets, can be quickly and easily beamed to individual students or to groups of students equipped with handhelds. Conversely, students can beam completed work, including papers and laboratory reports, to the instructor's handheld in seconds. The instructor then has the option of grading the assignments on the PDA or of synching assignments to another computer for grading or revision. Teachers can also use the PDA to keep up with administrative tasks, such as progress reports, IEPs, and discipline reports by synching the files to their handhelds. This is particularly useful for traveling teachers who move from classroom to classroom or from to school to school on a daily basis.

Using a free web-clipping service, such as *AvantGo*, provides instructors access to information that may assist them in planning activities such as projects, lesson plans, and lectures. Online weather updates, maps, and tourist information can make the process of planning a fieldtrip less time consuming for educators. Also, web-clipping services allow users to customize and select the pages that they want to download and use in their classrooms. Teachers can design their own virtual fieldtrips--or course web pages...and then assign students to download the pages to their handhelds for reference and class discussion. Individual teachers or schools can design web sites containing information that parents can download to their handhelds as well. This information can include syllabi, class rules, lesson plans, school and cafeteria calendars, faculty contact information, student academic handbooks, and other manuals that often fail to make it home in students' backpacks.

Instructional Uses

Using handhelds allows students to take greater responsibility for their assignments. It also allows them to visually see what is due so that they can organize their work, play, and study schedules more effectively. Knowing the details of an assignment, including its point value and due date, can help them set priorities. Using the handheld "effectively [gets] 'rid' of all the additional pieces of paper or additional notebooks" (McFadden, 2001).

Word Processing

Word-processed files such as a class syllabus and other course materials, including primary documents, can be stored on the Handheld for quick reference in class or on fieldtrips. This is particularly useful when explaining assignments and grading procedures to students who are engaged in complex tasks outside of the classroom.

Handhelds assist students in the writing process. Students can write, edit, and revise stories, papers, and journals on the handheld. They can also use the handheld to take class notes. Students working in groups can beam work to one another. Individual reading and writing exercises can be completed on handhelds as well.

> ***Integration Strategy 1.*** Students work together in small groups to create a poem, acrostics, biocrostics, or other creative writing tasks using their PDA's memo software or inexpensive word processing software. One students begins the writing activity by writing an entry into the file. This student then beams the document to the next student. That student adds an entry before beaming it to the next student for further work. Once completed, students can share the written work among the group before beaming the finished product to the teacher.

> ***Integration Strategy 2.*** Students use their handhelds to create, edit, and revise a reflective journal as they study historic events or as they work on a research project. The teacher then, at random, asks students to beam their journals to her PDA. The teacher beams responses or comments back to the students.

Spreadsheet Applications

Teachers are using handheld computers to record grades in various spreadsheets, including *Microsoft® Excel*. Keeping an electronic grade book on a handheld allows for quick reference when a student asks about a grade. It also allows the teachers to input grades into an electronic grade book stored on the handheld. This is particularly useful in classrooms where constructivist and cooperative group activities require teachers to engage in "on the fly" or alternate assessment of students' work. Handheld computers are also useful for teachers who require students to present oral reports or to participate in class discussion sessions. Quick access to the electronic grade book is useful for keeping up with attendance and tardy arrivals as well.

Using the handheld allows teachers to bypass the stationary computer and still maintain an accurate grade book. Handheld spreadsheets also can store attendance records and performance assessment charts (Roblyer & Edwards, 2000).

Students can create simple survey instruments that can be stored on the handheld. Students can use these surveys to conduct field research, including interviews, by recording data and other findings in a handheld spreadsheet, such as *Tiny Sheet™* (www.iambic.com), or in *Microsoft® Excel*. Completed surveys can be beamed to a central computer so that results can be tallied and discussed in class.

> ***Integration Strategy 3***. Students use spreadsheet software on their Handhelds to set up and manage financial information, such as stocks during a stock market simulation. Students obtain daily stock reports by either by clipping the information from *CNNfn* (http://www.cnnfn.com/) or the *Wall Street Journal* (http://wwww.wsj.com), or by imputing information obtained from other sources, such as the business section of a newspaper. Information, including the name of their stocks, purchase prices, daily or weekly percentage change in value, and other information about the stocks, is entered into the PDA. Students beam information to team members for discussion and decision making activities, such as what stocks to buy and what stocks to sell.

> ***Integration Strategy 4***. Students use their handhelds to conduct and collect social science research using a simple survey instrument. Groups of students fan out across the school to collect data from a variety of classes or grades. Once the surveys are completed the data can be combined for analysis and discussion.

Database Applications

Teachers can inventory instructional materials using database software available for the handheld. Information in the database can be beamed to other teachers. Additional databases can be used to store information on individual students. Information such as contact numbers, special health or medical needs, reading levels, or even student hobbies and interests can be stored in the handheld and quickly accessed as needed.

Students can use databases to store, sort, and search through large amounts of information which can serve as the source of original research and analysis. Students can merge individually collected data into a larger database simply by beaming or synching their databases.

> ***Integration Strategy 5***. Students work in groups to search through and analyze local census data (recent or historic) that the teacher has stored in a database program. Students began the activity by exploring the data and learning how to use the database software. Once they are comfortable with the software, they can begin to formulate questions that the database can help them answer concerning the local community during a particular time period (e.g., average family size, infant mortality rates, mortality rates, and other questions such as race and gender ratios.)

Integration Strategy 6. With handheld computers in hand, students explore local graveyards to obtain data about the local community. Students write the information (e.g,, name, gender, date of birth, and date of death) from the headstones into a PDA database. Once back in the classroom, the information is sorted and analyzed in the database software. Information regarding infant mortality rates, average age at death for specified time periods, or the occurrence of epidemics can be quickly identified by querying the database.

Integration Strategy 7. Students go into the field to investigate the local community by collecting data on the location, type, and number of historic buildings in a specified area. Using the database students draw conclusions about the impact of urbanization on the natural environment. They can also map locations to determine growth patterns in the local community.

Internet Applications

Web-clipping. Students and teachers can keep up with current events by clipping a variety of newspaper articles daily. Primary documents that can be "clipped" include the United States Constitution, the Declaration of Independence, and the Bill of Rights (Bull, Bull, & Whitaker, 2001).

Integration Strategy 6. Students clip articles from assigned newspapers to their handhelds. Working individually or in groups, students go through the paper to select and read an article on a current issue. Once the article is read, students use their handhelds to write a summary and a critique of the article using a writing prompt beamed to them by their instructor. A variation on this activity would have students clip articles on one topic or event from newspapers with different points of view. Once the articles are clipped, students read the articles and identify the content and point of view for each newspaper. Students come together for a roundtable discussion of the diversity of perspectives presented in the articles.

Additional Uses

Reference Materials. Handheld computers with eight megabits of ram or more can store a variety of dictionaries, thesauruses, or other reference tools. Storing these materials on the handheld provides teachers and students a source for quick reference materials.

Dictionaries, Thesauruses, and Other Writing Tools. Several freeware versions of dictionaries and thesauruses are available for download via the Internet. For example, the *Noah English Dictionary* ™ (http://www.arslexis.com/), with 122,000 words is available as freeware. As students use the handheld---or another computer---for word processing, they can quickly access a dictionary and thesaurus on the handheld (McFadden, 2001). Teachers and students in foreign language classes, can find free or inexpensive foreign language dictionaries online from several different Internet sites.

Integration Strategy 9. Working together students create a customized dictionary of economic terms using word processing or other software. Once created, this one-of-a-kind dictionary is used by students to assist them in completing homework and other assignments. A variations on this activity asks students to create a dictionary of geographic and geologic terms. Students can use this dictionaries to locate and identify natural features in the local area.

E-textbooks. Many publishers offer electronic versions of their textbooks. While many promote dedicated e-book readers texts can be stored on handheld computers as well. Teachers and students can easily download and read a variety of free classic texts from the *Electric Book Company*™ (http://www.elecbook.com) and other sites on the Internet. Access to texts is no longer limited by what books are available in the school library. Many online publishers, such as Amazon.com and Barnes and Noble, offer electronic books for purchase and download. Software like *Palm Reader*™ (http://www.peanutpress.com) and *Documents To Go*™ (see web site, http://www.dataviz.com) supplement a variety of free text readers that are available online.

Integration Strategy 10. Students supplement textbooks and available primary documents by downloading documents or literary works not commonly available in their libraries or in their local bookstores to their handhelds. Students read the material on their handhelds and use their handhelds to keep a response journal. The teacher beams additional writing prompts to the handhelds and makes random checks of the response journal.

Summary

Handhelds can be personal productivity tools as well as instructional tools for both social studies teacher and students. Handhelds prompt exploratory and constructivist practices in the classroom and in the field. Handhelds in the hands of students can assist them in acquiring critical thinking and creative thinking skills. They also make the learning process fun for students by giving them a greater sense of responsibility for their learning. The range of software promoting the integration of Handhelds into the K-12 setting expands daily. Educators and students who own and use Handhelds have varied tools and can expect the offerings to continue to improve.

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